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(54) Title: **COMPOSITION IMPROVING AGE-RELATED PHYSIOLOGICAL DEFICITS AND INCREASING LONGEVITY**

(57) Abstract: The invention relates to a food composition intended to prevent or restore age-related functional deficits in mammals, which comprises a combination being able to mimic the effects of caloric restriction on gene expression, said combination containing at least one molecule that stimulates energy metabolism of the cell and at least one antioxidant.

## Claims

1. A food composition intended to prevent or restore age-related functional deficits in mammals, which comprises a combination being able to mimic the effects of caloric restriction on gene expression, said combination containing at least one molecule that stimulates energy metabolism of the cell and at least one antioxidant.
2. A food composition according to claim 1, wherein said molecule stimulates in particular energy metabolism of the mitochondria.
3. A food composition according to claim 1 or 2, wherein said molecule is L-carnitine, creatine, fatty acids (monounsaturated and polyunsaturated, particularly omega-3 fatty acids), cardiolipin, nicotinamide or carbohydrate and natural sources thereof.
4. A food composition according to one of claims 1 to 3, wherein the amount of said molecule is of at least 1mg per kg of body weight per day, preferably from 1mg to 1 g per kg of body weight per day.
5. A food composition according to one of claims 1 to 4, wherein the antioxidant is a source of thiols such as lipoic acid, cysteine, cystine, methionine, S-adenosyl-methionine, taurine, glutathione or natural sources thereof, or a compound that upregulate their biosynthesis in vivo.
6. A food composition according to one of claims 1 to 5, wherein the amount of the antioxidant is of at least 0.025 mg per kg of body weight per day, preferably from 0.025 mg to 250mg per kg of body weight per day.
7. A food composition according to any of claims 1 to 6, in which the antioxidant is used alone or in association with other antioxidants such as vitamin C, vitamin E, carotenoids, ubiquinones, tea catechins, coffee extracts containing polyphenols and/or diterpenes, ginkgo biloba extracts, grape or grape seed extracts rich in proanthocyanidins, spice extracts, soy extracts containing isoflavones and

related phytoestrogens and other sources of flavonoids with antioxidant activity or compounds that upregulate cell antioxidant defenses such as ursodeoxycholic acid, ursolic acid, ginseng and ginsenosides and natural sources thereof.

5        8. A food composition according to any of claims 1 to 7, which is a nutritionally complete pet food or a dietary supplement.

9. A food composition according to any of claims 1 to 8, which is a nutritionally complete human food, or a dietary supplement.

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10. A food composition according to any of claims 1 to 9, which further comprises a prebiotic and/or a probiotic micro-organism.

11. A food composition according to one of claims 1 to 10, which prevents or  
15       delay mitochondria dysfunction's occurring during aging by modulating and/or regulating expression of genes linked to energy metabolism.

12. A food composition according to one of claims 1 to 11, which further  
improves skeletal and cardiac muscle function, vascular function, cognitive function,  
20       vision, hearing, olfaction, skin and coat quality, bone and joint health, renal health, gut function, immune function, insulin sensitivity, inflammatory processes.

13. Use of a combination being able to mimic the effects of caloric restriction on  
gene expression, which comprises at least one molecule that stimulates energy  
25       metabolism of the cell and at least one antioxidant, for the preparation of a composition intended to prevent or restore age-related functional deficits in mammals.

14. The use according to claim 13, wherein the molecule that stimulates energy  
30       metabolism of the cell and in particular the energy metabolism of the mitochondria is L-carnitine, creatine, fatty acids (mono and polyunsaturated, particularly omega-3 fatty acids), cardiolipin, nicotinamide or carbohydrate and natural sources thereof.

15. The use according to claim 13 or 14, wherein the antioxidant is a source of thiols (e.g. Lipoic acid, cysteine, cystine, methionine, S-adenosyl-methionine, taurine, glutathione and natural sources thereof), or a compound that upregulate their biosynthesis in vivo.

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16. The use according to any of claims 13 to 15, in which the antioxidant is used alone or in association with other antioxidants such as vitamin C, vitamin E, carotenoids, ubiquinones, tea catechins, coffee extracts containing polyphenols and/or diterpenes, ginkgo biloba extracts, grape or grape seed extracts rich in proanthocyanidins, spice extracts, soy extracts containing isoflavones and related phytoestrogens and other sources of flavonoids with antioxidant activity or compounds that upregulate cell antioxidant defense (e.g. ursodeoxycholic acid for increased glutathione S-transferase, ursolic acid for increased catalase, ginseng and ginsenosides for increase superoxide dismutase and natural sources thereof i.e. herbal medicines).

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17. The use according to any of claims 13 to 16, wherein the amount of said molecule is of at least 1mg per kg of body weight per day, preferably from 1mg to 1 g per kg of body weight per day and the amount of said antioxidant is of at least 0.025 mg per kg of body weight per day, preferably from 0.025 mg to 250mg per kg of body weight per day.

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18. The use according to one of claims 13 to 17, which prevents or delay mitochondria dysfunction's occurring during aging by modulating and/or regulating expression of genes linked to energy metabolism.

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19. The use according to one of claims 13 to 18, which further improves skeletal and cardiac muscle function, vascular function, cognitive function, vision, hearing, olfaction, skin and coat quality, bone and joint health, renal health, gut function, immune function, insulin sensitivity, inflammatory processes.

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20. A method to prevent or restore age-related functional deficits in mammals, comprising administering to the mammal a food composition according to claim 1 to 12.